

## Schedule 9. Standards for storm tide resiliency

### SC9.1 Minimum requirements for storm tide resiliency

This schedule contains standards that are considered to be generally acceptable to enhance the resiliency of development to the potential significant adverse effects of storm tide events.

#### Adopted storm tide inundation levels and minimum floor heights

The following information is extracted for the report: *Capricorn Coast Storm Tide Study Upgrade, Aurecon 2015*.

In areas where detailed storm tide modelling has been undertaken, the factors used in the modelling include:

- (1) Differing AEP events at 2100;
- (2) storm tide level (varies by location);
- (3) sea level rise (0.8m at 2100);
- (4) wave set-up (0.3m);
- (5) freeboard (0.3m);
- (6) wave run-up (varies by location).

The results of this modelling are summarised in Table SC9.1.1 below.

Minimum habitable floor heights have been adopted for twelve locations as indicated in Table SC9.1.1 below, reflecting properties along the 'coastal strip' and 'inland sites'. Inland sites do not include a wave run-up factor.

**Table SC9.1.1 Minimum habitable floor heights (expressed in metres AHD)**

Location	Coastal sites	Inland sites
Nine Mile Beach and north	7.2	5.1
Farnborough Beach	6.7	5.1
Yeppoon	7.0	5.2
Wreck Point	8.4	5.2
Lammermoor	7.9	5.1
Roslyn Bay	8.3	5.1
Kemp Beach and Mulambin beach	7.4	5.2
Kinka Beach	7.1	5.0
Emu Park	7.0	5.0
Zilzie	6.8	5.0
Keppel Sands	7.0	5.2
Long Beach	6.7	5.2

Table SC9.1.2 below indicates the adopted inundation levels for different AEP events at eight coastal localities. These figures include 0.8 metre for sea level rise to account for climate change and 0.3 metre freeboard allowance.

**Table SC9.1.2: Adopted inundation levels at different AEP events**

Location	Inundation level (expressed in metres AHD)				
	2%AEP	1%AEP	0.2%AEP	0.1%AEP	0.01%AEP
Bangalee	4.64	5.07	5.85	6.13	7.04
Causeway lake	4.68	5.18	6.10	6.44	7.55
Emu Park	4.58	4.96	5.66	5.90	6.71
Joskeleigh	4.75	5.17	5.91	6.17	7.04
Keppel Sands	4.74	5.15	5.89	6.15	7.02
Kinka Creek	4.61	5.02	5.74	6.00	6.86
Rossllyn Bay	4.63	5.05	5.81	6.08	6.97
Yeppoon	4.77	5.22	6.03	6.33	7.30

Note: maps showing these locations are contained within the *Capricorn Coast Storm Tide Study Upgrade, Aurecon 2015*.

**Table SC9.1.3: Storm tide hazard level where no modelling has been undertaken**

Location	Defined storm tide hazard level
In areas where detailed storm tide modelling has not been undertaken	The defined storm tide hazard level is identified as two (2) metres above highest astronomical tide, which includes a sea level rise factor of 0.8 metres to account for climate change projections to 2100.

Tables SC9.1.4 and SC9.1.5 below are extracted from the *Capricorn Coast Storm Tide Study Upgrade, Aurecon 2015* and provide detail on the components of storm tide modelling for coastal and inland sites at twelve locations along the Capricorn Coast.

**Table SC9.1.4: Storm tide hazard components: 1% AEP at 2100 – Coastal strip**

Location	Storm tide level (m AHD)	Sea level rise (m)	Wave set-up (m)	Free-board (m)	Wave run-up (m)	Defined minimum habitable floor levels 2100 (m AHD)
Nine Mile Beach & north	3.67	0.8	0.3	0.3	2.1	7.2
Farnborough Beach	3.67	0.8	0.3	0.3	1.6	6.7
Yeppoon	3.82	0.8	0.3	0.3	1.8	7.0
Wreck Point	3.82	0.8	0.3	0.3	3.2	8.4
Lammermoor	3.65	0.8	0.3	0.3	2.8	7.9
Rossllyn Bay	3.65	0.8	0.3	0.3	3.2	8.3
Kemp/Mulambin beaches	3.78	0.8	0.3	0.3	2.2	7.4
Kinka Beach	3.62	0.8	0.3	0.3	2.1	7.1
Emu Park	3.56	0.8	0.3	0.3	2.0	7.0
Zilzie	3.56	0.8	0.3	0.3	1.8	6.8

Keppel Sands	3.75	0.8	0.3	0.3	1.8	7.0
Long Beach	3.77	0.8	0.3	0.3	1.5	6.7

**Table SC9.1.5: Storm tide hazard components: 1% AEP at 2100 – Inland sites**

Location	Storm tide level (m AHD)	Sea level rise (m)	Wave set-up (m)	Free-board (m)	Defined minimum habitable floor levels 2100 (m AHD)
Nine Mile Beach & north	3.67	0.8	0.3	0.3	5.1
Farnborough Beach	3.67	0.8	0.3	0.3	5.1
Yeppoon	3.82	0.8	0.3	0.3	5.2
Wreck Point	3.82	0.8	0.3	0.3	5.2
Lammermoor	3.65	0.8	0.3	0.3	5.1
Rosslyn Bay	3.65	0.8	0.3	0.3	5.1
Kemp/ Mulambin Beaches	3.78	0.8	0.3	0.3	5.2
Kinka Beach	3.62	0.8	0.3	0.3	5.0
Emu Park	3.56	0.8	0.3	0.3	5.0
Zilzie	3.56	0.8	0.3	0.3	5.0
Keppel Sands	3.75	0.8	0.3	0.3	5.2
Long Beach	3.77	0.8	0.3	0.3	5.2

Table SC9.1.6 in this schedule contains standards that are considered to be generally acceptable to enhance resiliency of development to the potential significant adverse effects of storm tide events.

**Table SC9.1.6: Requirements for storm tide resilience for specific development**

Development		AEP (%)
Accommodation activities		
• Residential care facility		0.2%
• Caretaker's accommodation	• Non-resident workforce accommodation	1.0%
• Community residence	• Relocatable home park	
• Dual occupancy	• Resort complex	
• Dwelling house	• Retirement facility	
• Dwelling unit	• Rooming accommodation	
• Home based business	• Rural worker's accommodation	
• Multiple dwelling	• Short-term accommodation	
• Nature based tourism	• Tourist park	
Business activities		
• Agricultural supplies store	• Sales office	1.0%
• Funeral parlour	• Service station	
• Hardware and trade supplies	• Showroom	
• Outdoor sales	• Veterinary services	
• Bulk landscape supplies	• Garden centre	2.0%
• Car wash	• Market	
Centre activities		
• Adult store	• Office	1.0%
• Food and drink outlet	• Shop	

Development		AEP (%)
• Health care services	• Shopping centre	
Community activities		
• Hospital		0.2%
• Child care centre	• Educational establishment	1.0%
• Club	• Outstation	
• Community care centre	• Place of worship	
• Community use		
Entertainment activities		
• Bar	• Nightclub entertainment facility	1.0%
• Brothel	• Theatre	
• Function facility	• Tourist attraction	
• Hotel		
Industrial activities		
• High impact industry	• Research and technology industry	1.0%
• Low impact industry	• Service industry	
• Marine industry	• Special industry	
• Medium impact industry	• Warehouse	
Recreation activities		
• Major sport, recreation and entertainment facility		1.0%
• Indoor sport and recreation		2.0%
• Environment facility	• Outdoor sport and recreation Park	30.0%
• Motor sport facility		
Special activities		
• Air services	• Renewable energy facility	0.2%
• Emergency services	• Telecommunications facility	
• Major electricity infrastructure		
• Detention facility	• Utility installation	0.5%
• Substation		
• Crematorium		1.0%
• Parking station	• Transport depot	2.0%
• Cemetery	• Port services	N/A
• Landing		